

APPENDICES

APPENDICES

APPENDIX A
TRSDOS-II
Character Codes

Code		Character	
Dec.	Hex.	Keyboard	Video Display
			<div>Scroll mode</div> <div>Graphics mode</div>
00	00	(HOLD)	
01	01	(F1)	Turns on blinking cursor
02	02	(F2)	Turns off cursor
03	03	(BREAK)*	
		(CTRL C)	
04	04	(F3)	Turns on steady cursor
		(CTRL D)	
05	05	(CTRL E)	
06	06	(CTRL F)	
07	07	(CTRL G)	
08	08	(BACKSPACE)	Backspaces cursor and erases character
		(CTRL H)	
09	09	(TAB)	Advance cursor to next 8-character boundary
		(CTRL I)	
10	0A	(CTRL J)	Line feed
11	0B	(CTRL K)	Cursor to previous line.
12	0C	(F4)	
		(CTRL L)	
13	0D	(ENTER)	Carriage return
		(CTRL M)	
14	0E	(F7)	Dual routing on.
		(CTRL N)	
15	0F	(CTRL O)	Dual routing off.
16	10	(F6)	
		(CTRL P)	
17	11	(CTRL Q)	
18	12	(CTRL R)	
19	13	(F8)	
		(CTRL S)	
20	14	(CTRL T)	Homes cursor in scroll area.
21	15	(F5)	
		(CTRL U)	
22	16	(CTRL V)	
23	17	(CTRL W)	Erase to end of line
24	18	(CTRL X)	Erase to end of screen
25	19	(CTRL Y)	Sets white-on-black mode
26	1A	(CTRL Z)	Sets black-on-white mode
27	1B	(ESC)	Clears screen, homes cursor
28	1C	(↑)	Moves cursor back
29	1D	(↓)	Moves cursor forward
30	1E	(↶)	Sets 80-character mode and clears display
31	1F	(↷)	Sets 40-character mode and clears display

* **(BREAK)** is always intercepted. It will never return a X'03'.

Code		Character		
Dec.	Hex.	Key-board	Video Display	
			Scroll mode	Graphics mode
32	20	Space Bar	␣	␣
33	21	!	!	!
34	22	"	"	"
35	23	#	#	#
36	24	\$	\$	\$
37	25	%	%	%
38	26	&	&	&
39	27	,	,	,
40	28	(((
41	29)))
42	2A	*	*	*
43	2B	+	+	+
44	2C	,	,	,
45	2D	-	-	-
46	2E	.	.	.
47	2F	/	/	/
48	30	0	0	0
49	31	1	1	1
50	32	2	2	2
51	33	3	3	3
52	34	4	4	4
53	35	5	5	5
54	36	6	6	6
55	37	7	7	7
56	38	8	8	8
57	39	9	9	9
58	3A	:	:	:
59	3B	;	;	;
60	3C	<	<	<
61	3D	=	=	=
62	3E	>	>	>
63	3F	?	?	?
64	40	@	@	@
65	41	A	A	A
66	42	B	B	B
67	43	C	C	C
68	44	D	D	D

Code		Character		
Dec.	Hex.	Key-board	Video Display	
			Scroll mode	Graphics mode
69	45	E	E	E
70	46	F	F	F
71	47	G	G	G
72	48	H	H	H
73	49	I	I	I
74	4A	J	J	J
75	4B	K	K	K
76	4C	L	L	L
77	4D	M	M	M
78	4E	N	N	N
79	4F	O	O	O
80	50	P	P	P
81	51	Q	Q	Q
82	52	R	R	R
83	53	S	S	S
84	54	T	T	T
85	55	U	U	U
86	56	V	V	V
87	57	W	W	W
88	58	X	X	X
89	59	Y	Y	Y
90	5A	Z	Z	Z
91	5B	□	□	□
92	5C	CTRL 9	\	\
93	5D	□	□	□
94	5E	^	^	^
95	5F	—	—	—
96	60			`
97	61	A	a	a
98	62	B	b	b
99	63	C	c	c
100	64	D	d	d
101	65	E	e	e
102	66	F	f	f
103	67	G	g	g
104	68	H	h	h
105	69	I	i	i

Code		Character		
Dec.	Hex.	Key-board	Video Display	
			Scroll mode	Graphics mode
106	6A	J	j	j
107	6B	K	k	k
108	6C	L	l	l
109	6D	M	m	m
110	6E	N	n	n
111	6F	O	o	o
112	70	P	p	p
113	71	Q	q	q
114	72	R	r	r
115	73	S	s	s
116	74	T	t	t
117	75	U	u	u
118	76	V	v	v
119	77	W	w	w
120	78	X	x	x
121	79	Y	y	y
122	7A	Z	z	z
123	7B	}	}	}
124	7C	CTRL 0	:	:
125	7D	}	}	}
126	7E	CTRL 6	∨	∨
127	7F			±
128	80	*		
:	:			
:	:			
248	F8			
249	F9			Sets white-on-black mode
250	FA			Sets black-on-white mode
251	FB			Homes cursor
252	FC			Moves cursor back
253	FD			Moves cursor forward
254	FE			Moves cursor up
255	FF			Moves cursor down

* Codes 128-248 cannot be input from the keyboard or output to the display. When reading the display, a **value** greater than 127 indicates a reverse character corresponding to **value** mod 128.

APPENDIX B / Error Messages

There are three kinds of error messages you might get while using your computer:

- . Boot errors, such as BOOT ERROR DC. See the Boot Errors Table for more information.
- . Operating system errors, such as ERROR 24 or FILE NOT FOUND. To get a brief description of a numbered error, type ERROR followed by the error number displayed. For example, type:

ERROR 31 <ENTER>

and your screen shows:

PROGRAM NOT FOUND

For more information see the System Errors Table.

- . Application program errors -- see your application program manual.

When an error message is displayed:

- . Try the operation several times.
- . Look up boot errors and operating system errors in the following tables and take the recommended actions. See your application program manual for explanations of application program errors.
- . Trying using other diskettes.
- . Reset the computer and try the operation again.
- . Check all the power connections.
- . Check all interconnections.
- . Remove all diskettes from drives, turn off the computer, wait 15 seconds, and turn it on again.

- . If you try all these remedies and continue to get an error message, contact a Radio Shack Service Center.

Note: If more than one thing is wrong, the computer might wait until you correct the first error before displaying the second error message.

RSSC = Radio Shack Service Center.

Numerical System Errors Table

Register A usually has a return code after any function call. The Z flag is set when no error occurs. Exceptions are certain computational routines, which use Registers A and F to pass back data and status information.

Code	Message	Explanation/Action
0	No Error Found.	No error occurred.
1	Bad Function Code On SVC Call Or No Function Exists.	Check the function code number used on the SVC call.
2	Character Not Available.	No record or character was available when you you called the SVC.
3	Parameter Error On Call.	Parameter is incorrect or a required parameter is missing.
4	CRC Error During Disk I/O.	Try the operation again, using a different diskette. If the problem occurs often, contact RSSC.
5	Disk Sector Not Found.	Try a different diskette.
6	Attempt To Open A File Which Has Not Been Closed.	Close the file before re-opening.
7	Illegal Disk Change.	TRSDOS-II detected an illegal disk swap.
8	Disk Drive Not Ready.	Drive door is open or the diskette is not in the drive. On Thinline drives, check the DRIVE command settings.

Code	Message	Explanation/Action
9	Invalid Data Provided By Caller.	Data stream to be processed has illegal characters.
10	Maximum Of 16 Files May Be Open At Once.	Too many files are open at once.
11	File Already In Directory.	Filename already exists as a directory entry. Kill the existing file, choose another filename, or specify a drive number.
12	No Drive Available For An Open.	No on-line drive a. is write enabled b. has enough space to create a new file, or c. has a system directory.
13	Write Attempt To A Read Only File.	File was opened for read only, not for read/write.
14	Write Fault On Disk I/O.	Error occurred during a write operation. Try a different diskette. If the problem continues, contact RSSC.
15	Disk Is Write Protected.	Write enable the disk.
16	DCB Is Modified And Is Unusable.	DCB (used in machine- language programming) has been modified since the last disk access (while the file was open).
17	Directory Read Error.	Error occurred during an attempt to read the directory. Use a different diskette.

Code	Message	Explanation/Action
18	Directory Write Error.	Error occurred during an attempt to write to the directory. Use a different diskette.
19	Improper File Name (Filespec).	Filespec you gave does not meet TRSDOS-II standard file specifications.
20	** Unknown Error Code **	
21	** Unknown Error Code **	
22	** Unknown Error Code **	
23	** Unknown Error Code **	
24	File Not Found.	Filename you gave was not found on the available disks or the file is the incorrect type for the desired operation.
25	File Access Denied Due To Password Protection.	You gave an incorrect password. See the ATTRIB command.
26	Directory Space Full.	Number of filenames has reached the amount set when you formatted the disk.
27	Disk Space Full.	No space is available on the disk.
28	Attempt To Read Past EOF.	Specified record number is past the EOF.
29	Read Attempt Outside Of File Limits.	Use valid record numbers.

Code	Message	Explanation/Action
30	No More Extents Available (16 Maximum).	Use the COPY command to copy the files and reduce fragmentation. See also SAVE/RESTORE and MOVE.
31	Program Not Found.	Specified program is not found on the available disks.
32	Unknown Drive Number (Filespec).	Specified drive number is not valid.
33	Disk Space Allocation Cannot Be Made Due To Fragmentation Of Space.	Use the COPY command to copy the files and reduce fragmentation.
34	Attempt To Use A NON Program File As A Program.	File specified for execution is not a program file or the load address given is illegal. Make sure you have a system diskette in Drive 0.
35	Memory Fault During Program Load.	Program is loaded incorrectly, possibly because of faulty memory or a "bad" load address.
36	Parameter For Open Is Incorrect.	Check the OPEN statements or the DCB for errors.
37	Open Attempt For A File Already Open.	File specified for open is already open.
38	I/O Attempt To An Unopen File.	Open the file before access.

Code	Message	Explanation/Action
39	Illegal I/O Attempt.	a. I command not given after a diskette swap. b. Can be caused by an I/O attempt to a differently formatted disk. Format the disk under the current version of TRSDOS-II or use FCOPY.
40	Seek Error.	a. Data cannot be read from the disk -- faulty disk. b. When re-initializing a hard disk, you must also reformat the secondary drives.
41	Data Lost During Disk I/O (Hardware Fault).	Contact RSSC.
42	Printer Not Ready.	Check the connections, power, ribbon, on-line status, and so on.
43	Printer Out Of Paper.	Check the printer's paper supply.
44	Printer Fault (May Be Turned Off).	Check the connections, power, ribbon, on-line status, and so on.
45	Printer Not Available.	Check the connections, power, ribbon, on-line status, and so on.
46	Not Applicable To VLR Type Files.	Operation performed is not valid for VLR files.
47	Required Command Parameter Not Found.	Required parameter or argument is missing from the command.

Code	Message	Explanation/Action
48	Incorrect Command Parameter.	Option or argument given in the command is incorrect.
49	Hardware Fault During Disk I/O.	Contact RSSC.
50	Invalid Space Descriptor.	The space descriptor that tells TRSDOS-II which extent to read next is invalid. Try a different diskette.
51-255	** Unknown error code **	

Alphabetical System Errors Table

Message	Explanation/Action	Code
Attempt To Open A File Which Has Not Been Closed.	Close the file before re-opening.	6
Attempt To Read Past EOF.	Specified record number is past the EOF.	28
Attempt To Use A NON Program File As A Program.	File specified for execution is not a program file or the load address given is illegal. Make sure you have a system diskette in Drive 0.	34
Bad Function Code On SVC Call Or No Function Exists.	Check the function code number used on the SVC call.	1
Invalid Space Descriptor.	The space descriptor that tells TRSDOS-II which extent to read next is invalid. Try a different diskette.	50
BOOT ERROR	See the BOOT ERROR TABLE.	
Character Not Available.	No record or character was available when you called the SVC.	2
CRC Error During Disk I/O.	Try the operation again, using a different diskette. If the problem occurs often, contact RSSC.	4
DCB Is Modified And Is Unusable.	DCB (used in machine-language programming) has been modified since the last disk file access (while the file was open).	16

Message	Explanation/Action	Code
Data Lost During Disk I/O (Hardware Fault).	Contact RSSC.	41
Directory Read Error.	Error occurred during an attempt to read the directory. Try a different diskette.	17
Directory Space Full.	Number of filenames has reached the amount set when you formatted the diskette.	26
Directory Write Error.	Error occurred during an attempt to write to the directory. Use a different diskette.	18
Disk Drive Not Ready.	Drive door is open or the diskette is not in the drive. On Thinline drives, check the Drive command settings.	8
Disk Is Write Protected.	Write enable the disk.	15
Disk Sector Not Found.	Try a different diskette.	5
Disk Space Allocation Cannot Be Made Due To Fragmentation Of Space.	Use the COPY command to copy the files and reduce fragmentation.	33
Disk Space Full.	No space is available on the disk.	27
File Access Denied Due To Password Protection.	You gave an incorrect password. See ATTRIB command.	25
File Already In Directory.	Filename already exists as a directory entry. Kill the existing file, choose another filename, or specify a drive number.	11

Message	Explanation/Action	Code
File Not Found.	Filename you gave was not found on the available disks or the file is the incorrect type for the desired operation.	24
Hardware Fault During Disk I/O.	Contact RSSC.	49
I/O Attempt To An Unopen File.	Open the file before access.	38
Illegal I/O Attempt.	a. I command not given after a diskette swap. b. Can be caused by an I/O attempt to a differently formatted disk. Format the disk under the current version of TRSDOS-II or use FCOPY.	39
Illegal Disk Change.	TRSDOS-II detected an illegal disk swap.	7
Improper File Name (Filespec).	Filespec you gave does not meet TRSDOS-II standard file specifications.	19
Incorrect Command Parameter.	Option or argument given in the command is incorrect.	48
Invalid Data Provided By Caller.	Data stream to be processed has illegal characters.	9
Maximum Of 16 Files May Be Open At Once.	Too many files are open at once.	10
Memory Fault During Program Load.	Program is loaded incorrectly, possibly because of faulty memory or a "bad" load address.	35
No Drive Available For An Open.	No on-line drive a. is write enabled b. has enough space to create a new file, or c. has a system directory.	12

Message	Explanation/Action	Code
=====	=====	=====
No Error Found.	No error occurred.	Ø
-----	-----	-----
No More Extents Available (16 Maximum).	Use the COPY command to copy the files and reduce fragmentation. See also SAVE/RESTORE and MOVE.	3Ø
-----	-----	-----
Not Applicable To VLR Type Files.	Operation performed is not valid for VLR files.	46
-----	-----	-----
Open Attempt For A File Already Open.	File specified for open is already open.	37
-----	-----	-----
Parameter Error On Call.	Parameter is incorrect or a required parameter is missing.	3
-----	-----	-----
Parameter For Open Is Incorrect.	Check the OPEN statements or the DCB for errors.	36
-----	-----	-----
Printer Fault (May Be Turned Off).	Check the connections, power, ribbon, on-line status, and so on.	44
-----	-----	-----
Printer Not Available.	Check the connections, power, ribbon, on-line status, and so on.	45
-----	-----	-----
Printer Not Ready.	Check the connections, power, ribbon, on-line status, and so on.	42
-----	-----	-----
Printer Out Of Paper.	Check the printer's paper supply.	43
-----	-----	-----
Program Not Found.	Specified program is not found on available disks.	31
-----	-----	-----
Read Attempt Outside Of File Limits.	Use valid record numbers.	29
-----	-----	-----
Required Command Parameter Not Found.	Required parameter or argument is missing from the command.	47
=====	=====	=====

Message	Explanation/Action	Code
Seek Error.	a. Data cannot be read from the disk -- faulty disk. b. When re-initializing a hard disk, you must also reformat the secondary drives.	40
Unknown Drive Number (Filespec).	Specified drive number is not valid.	32
** Unknown Error Codes **		51-127
Write attempt to a read only file.	File was opened for read only, not for read/write.	13
Write fault on disk I/O.	Error occurred during a write operation. Try a different diskette. If the problem continues, contact RSSC.	14

Boot Errors Table

Error	Message	Explanation/Action
BOOT ERROR CK	Checksum error -- possibly a defective ROM.	Contact RSSC.
BOOT ERROR CT	Defective CTC chip.	Contact RSSC.
BOOT ERROR DC	Floppy disk controller error. a. Defective diskette. b. Floppy disk expansion unit not on. c. Defective FDC Chip or Drive.	a. Try a different diskette. b. Turn on the floppy disk expansion unit. c. Contact RSSC.
BOOT ERROR DM	DMA chip failure.	Contact RSSC.
BOOT ERROR DØ	Drive not ready. a. Improperly inserted diskette. b. Defective diskette. c. Defective drive.	a. Insert the diskette again and press <RESET>. b. Try a different diskette. c. Contact RSSC.
BOOT ERROR HA	Controller error. Aborted command: Problem during boot-up of hard disk.	Re-initialize the hard disk or contact RSSC.
BOOT ERROR HC	CRC error. Invalid data in data field.	Re-initialize the hard disk or contact RSSC.

Error	Message	Explanation/Action
=====	=====	=====
BOOT ERROR HD	Controller error. Busy not reset.	a. Re-initialize the hard disk. b. Power down, wait 10 seconds, and power up. If the error occurs again, contact RSSC.
-----	-----	-----
BOOT ERROR HI	CRC error. Invalid data in ID field.	Re-initialize the hard disk.
-----	-----	-----
BOOT ERROR HM	Data address mark not found.	Re-initialize the hard disk.
-----	-----	-----
BOOT ERROR HN	ID not found. No Boot Track.	Re-initialize the hard disk.
-----	-----	-----
BOOT ERROR HØ	Track Ø error on hard disk. a. Didn't find Track Ø before time-out. b. Secondary hard disk drives not turned on.	a. Press <RESET>. b. Turn on your secondary hard disk drives.
-----	-----	-----
BOOT ERROR HT	Time-out while waiting for Ready. a. Hard disk drive not powered up. b. Hard disk drive isn't turned on and ready within 10 seconds after the computer. c. Hard disk drive is disconnected.	a. Follow correct procedure: Turn on the hard disk first. b. Press <RESET>. c. Connect the hard disk drive or operate under floppy disk control.
=====	=====	=====

Error	Message	Explanation/Action
BOOT ERROR LD	Lost data during read -- FDC (floppy disk controller) or drive fault.	Try another TRSDOS-II diskette or contact RSSC.
BOOT ERROR MF	Memory failure in address range X'1000'-X'7FFF'.	Contact RSSC.
BOOT ERROR MH	Memory failure in address range X'8000'-X'FFFF'.	Contact RSSC.
BOOT ERROR ML	Memory failure in address range X'0000'-X'0FFF'.	Contact RSSC.
BOOT ERROR PI	Defective PIO Chip.	Turn on the expansion bay if it is off. If the error occurs again, contact RSSC.
BOOT ERROR RS	The diskette in Drive 0 is not Radio Shack operating system format.	Insert a TRSDOS-II formatted diskette into Drive 0 and press <RESET>.
BOOT ERROR SC	CRC Error. Invalid data on diskette or defective diskette.	Try a different diskette.
BOOT ERROR TK	Record not found bootstrap track. Improperly formatted or defective diskette.	Re-format your diskette or try a different diskette.

Error	Message	Explanation/Action
=====	=====	=====
BOOT ERROR Z8	Defective CPU.	Contact RSSC.
-----	-----	-----
NOT A SYSTEM DISK	Diskette in Drive Ø isn't a TRSDOS-II operating system diskette.	Insert a TRSDOS-II operating system diskette into Drive Ø.
=====	=====	=====

APPENDIX C / Alphabetical SVC Quick Reference List

Name	Description	No.
ACTRL	Performs control functions on Channel A	100
ARCV	Returns a character from Channel A	96
ATX	Outputs a character to Channel A	97
BCTRL	Performs control functions on Channel B	101
BINDEC	Converts binary to ASCII-coded decimal, and vice versa	21
BINHEX	Converts binary to ASCII-coded hexadecimal, and vice versa	24
BRCV	Returns a character from Channel B	98
BTX	Outputs a character to Channel B	99
CLOSE	Terminates access to an open file	42
CLRXT	Clears RAM and returns to TRSDOS-II	57
CURSOR	Turns the blinking cursor on or off	26
DATE	Sets or returns the date and time	45
DELAY	Provides a delay routine	6
DIRRD	Reads the specified record (direct access)	35
DIRSET	Gets directory information on an open file	59
DIRWR	Writes the specified record (direct access)	44
DISKID	Reads the diskette ID(s)	15

Name	Description	No.
DOSCMD	Sends TRSDOS-II a command and then returns to TRSDOS-II Ready	37
ERRMSG	Returns an error message to buffer	52
ERROR	Displays "ERROR number"	39
FILPTR	Gets the pointers of an open file	58
HLDKEY	Suspends and restarts terminal output whenever you press <HOLD>	29
INITIO	Initializes all input/output drivers	Ø
JP2DOS	Returns to TRSDOS-II Ready	36
KBCHAR	Gets a character from the keyboard	4
KBINIT	Clears stored keystrokes	1
KBLINE	Gets a line from the keyboard	5
KBPUT	Puts a character in the key-ahead buffer	3Ø
KILL	Deletes the file from the directory	41
LOCATE	Returns the current record number	33
LOOKUP	Searches through a table	28
MPYDIV	Performs multiplication or division with one 2-byte value and one 1-byte value	23
OPEN	Sets up access to a new or existing file	4Ø
PARSER	Finds the alphanumeric parameter field in a text string	46
PRCHAR	Sends a character to the printer	18
PRCTRL	Controls printer operations	95

Name	Description	No.
PRINIT	Initializes the line printer driver	17
PRLINE	Sends a line to the printer	19
RAMDIR	Gets directory information into RAM	53
RANDOM	Provides a random number in the range [0,254]	20
RDDIR	Reads a directory record	32
READNX	Gets the next record (sequential access)	34
RENAME	Renames a file	47
RETCMD	Sends TRSDOS-II a command and a return to caller	38
REWIND	Rewinds a disk file	48
RS232C	Sets or turns off Channel A or B for serial input/output	55
SCROLL	Sets the number of lines at the top of the display that are not scrolled	27
SETBRK	Sets up the <BREAK> key processing program	3
SETUSR	Sets up a user-defined SVC	2
SOUND	Turns on a tone	60
SORT	Sorts a list in RAM	56
SOUND	Turns on a single tone	60
STCMP	Compares two text strings	22
STSCAN	Looks for a specified string inside a text buffer	49

Name	Description	No.
TIMER	Sets a timer to interrupt a program	25
VDCHAR	Sends a character to the video (scroll mode)	8
VDGRAF	Sends a character to the video (graphics mode)	10
VDINIT	Initializes the display	7
VDLINE	Sends a line to the video (scroll mode)	9
VDREAD	Reads characters from the video (scroll mode)	11
VIDKEY	Displays a message and gets a line from the keyboard	12
VIDRAM	Copies a screenful of graphics and/or text from a RAM buffer to the display, or vice versa	94
WILD	Compares a file specification with a wildcard specification	51
WRITNX	Writes the next record (sequential access)	43

APPENDIX D / Numerical SVC Quick Reference List

No.	Name	Description
0	INITIO	Initializes all input/output drivers
1	KBINIT	Clears stored keystrokes
2	SETUSR	Sets up a user-defined SVC
3	SETBRK	Sets up the <BREAK> key processing program
4	KBCHAR	Gets a character from the keyboard
5	KBLINE	Gets a line from the keyboard
6	DELAY	Provides a delay routine
7	VDINIT	Initializes the display
8	VDCHAR	Sends a character to the video (scroll mode)
9	VDLINE	Sends a line to the video (scroll mode)
10	VDGRAF	Sends a character to the video (graphics mode)
11	VDREAD	Reads characters from the video (graphics mode)
12	VIDKEY	Displays a message and gets a line from the keyboard
15	DISKID	Reads the diskette ID(s)
17	PRINIT	Initializes the line printer driver
18	PRCHAR	Sends a character to the printer

No.	Name	Description
19	PRLINE	Sends a line to the printer
20	RANDOM	Provides a random number in the range [0,254]
21	BINDEC	Converts binary to ASCII-coded decimal, and vice versa
22	STCMP	Compares two text strings
23	MPYDIV	Performs multiplication or division with one 2-byte value and one 1-byte value
24	BINHEX	Converts binary to ASCII-coded hexadecimal, and vice versa
25	TIMER	Sets a timer to interrupt program
26	CURSOR	Turns the blinking cursor on or off
27	SCROLL	Sets the number of lines at the top of the display that are not scrolled
28	LOOKUP	Searches through a table
29	HLDKEY	Suspends and restarts terminal output whenever you press <HOLD>
30	KBPUT	Puts a character into the key-ahead buffer
32	RDDIR	Reads a directory record
33	LOCATE	Returns the current record number
34	READNX	Reads the next record (sequential access)
35	DIRRD	Reads the specified record (direct access)
36	JP2DOS	Returns to TRSDOS-II Ready

No.	Name	Description
37	DOSCMD	Sends TRSDOS-II a command and then returns to TRSDOS-II Ready
38	RETCMD	Sends TRSDOS-II a command and a return to caller
39	ERROR	Displays "ERROR number"
40	OPEN	Sets up access to a new or existing file
41	KILL	Deletes the file from the directory
42	CLOSE	Terminates access to an open file
43	WRITNX	Writes the next record (sequential access)
44	DIRWR	Writes the specified record (direct access)
45	DATE	Sets or returns the date and time
46	PARSER	Finds the alphanumeric parameter field in a text string
47	RENAME	Renames a file
48	REWIND	Rewinds a disk file
49	STSCAN	Looks for a specified string inside a text buffer
51	WILD	Compares a file specification with a wildcard specification
52	ERRMSG	Returns an error message to the buffer
53	RAMDIR	Gets directory information into RAM
55	RS232C	Sets or turns off Channel A or B for serial input/output

No.	Name	Description
56	SORT	Sorts a list in RAM
57	CLREXIT	Clears RAM and returns to TRSDOS-II
58	FILPTR	Gets the pointers of an open file
59	DIRSET	Gets directory information on an open file
60	SOUND	Turns on a single tone
94	VIDRAM	Copies a screenful of graphics and/or text from a RAM buffer to the display, and vice versa
95	PRCTRL	Controls printer operations
96	ARCV	Returns a character from Channel A
97	ATX	Outputs a character to Channel A
98	BRCV	Returns a character from Channel B
99	BTX	Outputs a character to Channel B
100	ACTRL	Performs control functions on Channel A
101	BCTRL	Performs control functions on Channel B

APPENDIX E / Summary of the Differences
between TRSDOS and TRSDOS-II

Table 1 / General Items

Item	How TRSDOS-II Differs
Method of Allocation	Allocation is done by sectors, instead of by granules.
Number of Files	Variable up to 1220 files, instead of fixed at 96. Defaults to 180 for floppy diskettes and 336 for hard disks. See the FORMAT utility.
Technique for Locking Out Flaws	Flawed areas are locked out by sectors, instead of by tracks.
Reverse Video Mode	When in the reverse video mode (black characters on green/white background) and in the scroll mode, the video scrolls a green/white line instead of a black line.
Wildcards	You can use the symbol ! (exclamation point) as a super wildcard symbol. It is the same as */* (used for files that have extensions) and * (used for files that do not have extensions). For example: KILL !:3 allows all the user files in Drive 3 to be killed.
SETCOM with FORMS	You need not execute a SETCOM command before "FORMS S" when using a serial printer. However, you still must execute SETCOM before sending data to the printer.

Table 1 (continued)

Item	How TRSDOS-II Differs	
Power-Up Diagnostics	<p>New Diagnostic Errors:</p> <p>BOOT ERROR CT -- indicates a defective CTC chip. Contact your Radio Shack Service Center.</p> <p>BOOT ERROR MF -- indicates a memory failure in address range X'1000' - X'7FFF'. Contact your Radio Shack Service Center.</p> <p>BOOT ERROR ML -- indicates a memory failure in address range X'0000' - X'0FFF'. Contact your Radio Shack Service Center.</p>	
Error Codes	<p>New Error: ERROR 50 -- Invalid Space Descriptor. The space descriptor that tells TRSDOS-II which extent to read next is invalid. Try a different diskette.</p> <p>Errors 20, 21, 22, and 23 are not used.</p> <p>BASIC also returns an FL Error (too many files). This error was previously undefined.</p>	
Memory Requirements	<p>X'0000'-X'27FF'</p> <p>X'2800'-X'2FFF'</p> <p>X'3000'-X'FFFF'</p> <p>X'F000'-X'FFFF'</p>	<p>Resident Area</p> <p>Utility Command</p> <p>Overlay Area</p> <p>User Area</p> <p>TRSDOS-II Demand</p> <p>Resident Area</p>

Table 2 / Supervisor Calls (SVCs)

Name	How TRSDOS-II Differs	Code
DIRRD	Enhanced -- reads the specified record	35
DIRWR	Enhanced -- writes the specified record	44
DISKID	Enhanced -- reads disk ID	15
KBPUT	New -- puts characters into a key-ahead keyboard buffer	30
LOCATE	Enhanced -- returns a record number	33
OPEN	Enhanced -- opens/creates a file	40
RDDIR	New -- reads the next directory record and builds an ASCII string	32
REWIND	New -- rewinds a disk file to the beginning of the file	48
RS232C	Enhanced -- initializes Serial Communication Channels A and B	55
SOUND	New -- turns on a tone in computers that are capable of generating sound	60

The new SVCs are created specifically for use under TRSDOS-II.

Note: We recommend restricting your use of the RAMDIR and FILPTR SVCs since each is restricted to 96 files. If you are not familiar with these supervisor calls, you should change your existing programs to use RDDIR instead.

Table 3 / Commands and Utilities

Name	How TRSDOS-II Differs
ANALYZE	No longer available -- cannot be used under TRSDOS-II
BACKUP	Enhanced -- duplicates floppy diskettes
BUILD	Enhanced -- creates an automatic command input file
CLICK	New -- Turns the key entry sound on or off for those computers that support sound.
CLOCK	No longer available -- cannot be used under TRSDOS-II
DIR	Enhanced -- displays a diskette's directory
DRIVE	New -- lets you gain the best use of the floppy disk drive by changing the seek rate, disk swap detect, and wait for drive ready status
FC	New -- edits and repeats the last command line entered
FCOPY	New -- transfers files on floppy diskette TRSDOS 1.2, 1.2a, 2.0, 2.0a, or 2.0b to a floppy diskette formatted under TRSDOS-II (and vice versa except to TRSDOS 1.2 and 1.2a)
FILES	New -- displays an alphabetical list of filenames in a disk's directory.
FLOPPY	New -- tells TRSDOS-II to ignore the drive numbers in all file specifications
FORMAT	Enhanced -- formats a disk for data storage

Table 3 (continued)

=====	
Name	How TRSDOS-II Differs
=====	
FREE	Enhanced -- displays the number of free contiguous sectors and the total amount of free space that are on a disk
HELP	Important note only -- gives the proper syntax for TRSDOS-II commands
I	Enhanced -- lets you swap diskettes
LIB	Enhanced -- displays the library commands
RESTORE	New -- lets you retrieve the information stored in compressed form by SAVE
SAVE	New -- lets you "compress" and store information onto diskettes for archive purposes
VERIFY	Enhanced -- verifies readable data
XFERSYS	No longer available -- cannot be used under TRSDOS-II
=====	

APPENDIX F / More About SAVE and RESTORE

Backing Up Your Hard Disk

What would you do if you suddenly lost the data stored on your hard disk system? Imagine the time it would take to re-enter all the data.

If, however, you have safe, floppy-diskette copies of the data, you would not have to re-enter all the data. You could simply restore the data to the hard disk, update the information, as needed, and continue.

Two programs on your hard disk assist you in creating such duplicates.

SAVE -- stores a specified group of files on a set of floppy diskettes. These diskettes are in a special, compact format that is not directly readable from TRSDOS-II.

In this format, files consume almost half the space they normally do on floppy diskettes. **SAVE** also lets you store files (from the hard disk) that are normally too large to fit on a floppy diskette.

RESTORE -- lets you retrieve the saved files to the hard disk.

This is the only way to recover saved diskettes. Trying to access a saved diskette by using other TRSDOS-II commands makes the system appear "locked up" for a short time while TRSDOS-II tries to read the saved diskette.

Saving Multiple Diskettes

Because the hard disk drive is a larger storage system than the floppy diskette, you sometimes need to save information onto more than one diskette. In such a case, **SAVE** prompts you to insert a new diskette.

There are two terms related to SAVE with which you need to be familiar:

- . **Dataset** -- A set of one or more diskettes created by SAVE. Each dataset has a unique identifier, such as 84 4E 56. RESTORE uses the identifier to ensure that you do not insert a volume from a different dataset.
- . **Volume** -- A diskette that is a member of a dataset. TRSDOS-II numbers each dataset's volumes in order from Ø.

When you are saving files that require more than one volume, TRSDOS-II prompts with:

Insert NEXT Blank Diskette on Drive n --
Press ANY Key to Continue.

After you do, TRSDOS-II prompts with:

The Diskette Presently on Drive n
will be referred to as "VOLUME 1"

TRSDOS-II saves the files and then prompts:

Insert "VOLUME Ø" on Drive n --
Press ANY Key to Continue

TRSDOS-II writes its housekeeping information -- including the number of volumes in the dataset -- to Volume Ø. RESTORE uses the information to retrieve the files.

Examples

There is a variety of ways to use SAVE. The simplest is:

SAVE 1 TO 2 {ALL} <ENTER>

This copies all the files from Drive 1 into a compact form on the diskette in Drive 2.

Wildcarding

Wildcards also offer an easy way to save several files or an entire disk. For example:

```
SAVE */CBL:4 TO Ø <ENTER>
```

saves all Drive 4 files with the extension /CBL and puts them on the diskette in Drive Ø.

Using the IND Option

The indirect option lets you save groups of files by creating an indirect file, a file consisting of one or more filespecs (similar to a DO file). You can use the BUILD command to create this list of filespecs.

At TRSDOS-II READY, type:

```
BUILD PROGRAMS:Ø <ENTER>
```

This creates an indirect file called PROGRAMS.

After TRSDOS-II prompts you with:

```
Enter Command Line (1-8Ø)  
.....
```

Enter your list of file specifications including drive numbers, for example:

```
ORDERS:5 <ENTER>  
REPORTS/*:6 <ENTER>
```

To exit the BUILD and return to TRSDOS-II READY, press <BREAK>.

You are now ready to save the files (specified by the indirect file) to the specially formatted floppy diskette. Type:

```
SAVE PROGRAMS:Ø TO 1 {IND} <ENTER>
```

Both ORDERS and REPORTS are now found in the file named PROGRAMS on the diskette in Drive Ø and saved to the diskette in Drive 1.

Note: The IND option lets you save more than one file from each hard disk; it also lets you save from more than one hard disk. As a result, you might save multiple files that have the same name. Because the save and restore directory does not specify drive numbers for files, you could lose duplicate filenames.

For example, if you created an indirect file that has these files:

```
*/FOR:4
*/CBL:4
*/FOR:5
```

Drives 4 and 5 may have duplicate filenames with the /FOR extension. Before you use indirect, examine all the files to be saved. Rename any duplicate filenames before saving or create different datasets.

Using the DC and DM Options

Another way to save files is to do so with respect to their creation or modification (update) dates. For example, suppose your directory showed these creation and update dates for your files:

Filename	Created	Updated
MENU/PRG	6/1/81	9/2/81
PRGONE/PRG	6/1/81	8/16/81
PRGTWO/PRG	6/1/81	7/30/81
PRGTHR/PRG	6/1/81	6/16/81
PAYROLL/DAT	9/15/81	10/15/81
CHECKS/DAT	9/15/81	10/15/81
TEST/PRG	10/29/81	10/29/81

If you want to save only those files created on June 1, 1981, use the following command:

```
SAVE */*:5 TO 0 {DC=060181} <ENTER>
```

The first four files are saved to the floppy diskette in Drive 0.

In the same sense, the first four files were updated on or before September 2, 1981 (9/2/81). Type:

```
SAVE */PRG:5 TO Ø {DM<Ø9Ø281} <ENTER>
```

and all files updated on or before the specified date are saved.

How Often Should You Save Your Files?

How often you should save your files depends upon you and how much data you enter. If you enter large amounts of data, you should make frequent backups, once or twice a day.

We suggest you keep two major sets of backup files:

- . **Monthly Save Set** -- At the first of each month, make a save set of the complete hard disk, including your programs.
- . **Daily Save Set** -- At the end of each day, or at most every third day, make a save set of all files that have been created or updated since the monthly save set was created.

If your hard disk fails, your monthly save set supplies most of your lost data and programs. After you restore this information and that from the daily save set, the amount you need to re-enter is minimal.

Creating a Monthly Save Set

Creating a monthly save set takes time, but it is worth it. Have a supply of blank diskettes ready. Do not format them; SAVE organizes the diskettes into its own special format.

Insert a blank diskette into Drive Ø. At TRSDOS-II Ready, type:

```
SAVE :4 :Ø {SYS,ALL,ABS} <ENTER>
```

to save all programs and data files, including system files stored on Drive 4, the primary drive. The files are stored on diskettes in Drive Ø. As one diskette becomes full, TRSDOS-II prompts you for the next diskette.

When all of the files are saved, TRSDOS-II prompts you to insert Volume Ø (of your monthly save set) into Drive Ø. TRSDOS-II now updates that diskette with housekeeping information.

When the save is finished, you are returned to TRSDOS-II Ready. Label, number, and date the diskettes.

Rotating Monthly Save Sets

The set just created is the current monthly save set. At the beginning of the next month, create a new monthly save set using different diskettes. This set becomes the current set; the other becomes the previous set.

Rotate these two sets of diskettes when making monthly save sets, always using the previous set (older) to make the current set.

Creating A Daily Save Set

When you restore lost information, your daily save sets determine how much information you must re-enter. The more often you save, the less you re-enter.

Because the daily save sets are so important, you should keep two sets of them: the current daily set and the previous daily set. This way, if something happens to the current set, you have the previous set to fall back on.

The simplest way to create a daily save set is to save those files created or updated since you created the monthly save set. To do this, type:

```
SAVE !:4 :Ø {DM>mmddyy,ABS,SYS} <ENTER>
```

The !:4 specifies all files, with or without extensions. The option DM>mmddyy saves all files updated on or after the specified date. However, if you keep a monthly save set as suggested, this also saves files created after a specified date. (The update date and the creation date in the directory are the same when the file is created.)

For example, if you create a monthly set on January 1, 1983 (01/01/83), then use the following command to make a daily set:

```
SAVE !:4 :0 {DM>010183,ABS,SYS}
```

This saves all files created or updated on or after January 1, 1983 up to the current date. Because the absolute option is specified, you are not prompted as each file is saved.

Rotating Daily Save Sets

The set just created is the current daily save set. At the end of the next working day, create a new daily save set using different diskettes. This set becomes the current set; the other becomes the previous set.

Rotate these two sets of diskettes when making daily save sets, always using the previous set (older) to make the current set.

Restoring Your Files

If your hard disk system fails, and you must recover all files, follow these steps:

1. If Drive 4 is not bootable, or the operating system is lost, you must re-initialize your system, following the instructions given in your Hard Disk Owner's Manual. If you are sure Drive 4's operating system is not damaged, proceed to step 2.
2. Insert Volume 0 of your monthly save set, into Drive 0 and type:

```
RESTORE :0 :4 {ABS,SYS} <ENTER>
```
3. Insert Volume 0 of your daily save set into Drive 0 and type:

```
RESTORE :0 :4 {ABS,SYS} <ENTER>
```


4. Re-enter any information added since the last current daily save set was created.

To restore one file, type the following command:

```
RESTORE filespec:Ø :4 {ABS} <ENTER>
```

where filespec is the name of the file you want restored.

To restore a group of files, type:

```
RESTORE :Ø :4 {PROMPT} <ENTER>
```

Restore prompts before restoring the files. Answer by pressing <Y> or <N> (for "yes" or "no").

Always restore files from the last save set available.

When a Boot Error Occurs on Hard Disk

If your hard disk system returns a boot error, flip the RESET switch on the front of your computer. Then, try to start up your system again. If your system continues to return a boot error, you probably have lost the boot track, Track Ø.

Even when this happens, there is a way to save the contents of your primary hard disk. But, to do so, you must have at least two floppy disk drives on your system.

To save the contents of your hard disk system:

1. Transfer control to the floppy disk system (press <BREAK> <REPEAT> during "white-out").
2. Insert a diskette containing the current floppy version of TRSDOS-II in Drive Ø and start up the system so that you see TRSDOS-II Ready.
3. To be sure there is a chance to save the contents of your hard disk, try to get a directory of your primary hard disk drive. Type:

```
DIR 4 <ENTER>
```

If you can get a directory, then you probably can save the contents of your hard disk.

4. To save the contents of your primary hard disk drive, insert a blank diskette in Drive 1 and type:

SAVE 4 TO 1 {SYS,ALL,ABS} <ENTER>

5. After the contents of your hard disk are saved, re-initialize your primary hard disk drive. (See your Hard Disk Owner's Manual for details.)
6. When the initialization is finished, (in about 15 to 20 minutes), you can restore the files that you saved. Type:

RESTORE 1 TO 4 {SYS} <ENTER>

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